CLAIMS

1. A method of detecting a packet comprising:

sampling a received signal to produce a sequence of samples wherein the sequence of samples includes a plurality of subsequences of samples;

cross correlating the subsequences of samples with a known form of the subsequence to produce cross correlations;

self correlating the cross correlations to produce a plurality of self correlations;

summing the self correlations; and

processing the sum of the self correlations.

2. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes comparing the magnitude of the sum of the self correlations to a threshold.

3. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes comparing for a period of time the magnitude of the sum of the self correlations to a first threshold and summing the sums of the self correlation whose magnitudes exceed the first threshold and comparing the magnitude of summed sums to a second threshold.

4. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes comparing for a period of time the magnitude of the sum of the self correlations to a first threshold and summing magnitudes of the sum of the self correlation that exceed the first threshold and comparing the summed magnitudes to a second threshold.

5. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes comparing for a period of time the greater of the magnitude of the real part of the sum of the self correlations and the magnitude of the imaginary part of the sum of the self correlations to a first threshold and summing greater of the real magnitude and the imaginary magnitudes of the sum of the self correlation that exceed the first threshold and comparing the summed magnitudes to a second threshold.

6. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes comparing for a period of time the magnitude of the sum of the self correlations to a first threshold and summing magnitudes of the sum of the self correlation that exceed the first threshold and comparing the summed magnitudes to a second threshold.

7. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes determining a frequency offset from the phase of the sum of the self correlations.

8. A method of detecting a packet as recited in claim 1 wherein processing the sum of the self correlations includes determining a packet boundary based on the time when the sum of the self correlations is determined to be a maximum.

9. A method of detecting a packet as recited in claim 1 wherein summing the self correlations includes adjusting the sign of the self correlations according to a known sequence.

10. A method of detecting a packet as recited in claim 1 wherein summing the self correlations includes adjusting the sign of the self correlations according to a pseudorandom sequence.

11. A method of detecting a packet as recited in claim 1 further including resetting the sum of the self correlations to zero upon the occurrence of an automatic gain control adjustment.

12. A method of detecting a packet as recited in claim 1 further including resetting upon the occurrence of an automatic gain control adjustment.

13. A method of detecting a packet as recited in claim 1 further including determining a frequency offset from the angle of the sum of the self correlations.

14. A method of detecting a packet as recited in claim 1 further including rescaling the received signal to reduce the number of bits required for cross correlation and self correlation

15. A method of encoding a packet having a packet header to facilitate synchronization including:

generating a sequence of symbols for a packet detection portion of the packet header;

repeating the sequence of symbols in the packet detection portion wherein the signs of selected ones of the repeated sequences are reversed.

16. A method of encoding a packet as recited in claim 15 wherein the selected ones of the repeated sequences are determined according to a pseudorandom sequence.

17. A method of encoding a packet as recited in claim 15 wherein a symbol at the end of one sequence is averaged with a symbol at the beginning of a following sequence.

18. A packet header signal designed to facilitate synchronization including:

a repeated sequence of symbols for a packet detection portion of the packet header wherein the signs of selected ones of the repeated sequences are reversed.

19. A packet header signal as recited in claim 18 wherein the selected ones of the repeated sequences are determined according to a pseudorandom sequence.

20. A receiver configured to detect a packet comprising:

an ADC configured to sample a received signal to produce a sequence of samples wherein the sequence of samples includes a plurality of subsequences of samples;

a cross correlator configured to cross correlate the subsequences of samples with a known form of the subsequence to produce cross correlations;

a self correlator configured to self correlate the cross correlations to produce a plurality of self correlations;

an adder configured to sum the self correlations; and

a processor configured to process the sum of the self correlations.

21. A transmitter configured to transmit an encoded a packet having a packet header to facilitate synchronization including:

a sequence generator configured to generate a sequence of symbols for a packet detection portion of the packet header;

an encoder configured to repeat the sequence of symbols in the packet detection portion wherein the signs of selected ones of the repeated sequences are reversed.

22. A transmitter configured to transmit an encoded a packet having a packet header to facilitate synchronization as recited in claim 17 wherein the selected ones of the repeated sequences are determined according to a pseudorandom sequence.

5